REMARKS

Claims 1-20 are pending in the current application. Claims 1 and 3 are independent claims. In view of the following remarks, favorable reconsideration and withdrawal of the rejections is respectfully requested.

Initially, Applicants appreciate the Examiner's acknowledgment that all certified copies pertaining to foreign priority claimed under 35 U.S.C. §119 have been received and the indication that the references submitted in the Information Disclosure Statements filed on August 20, 2004 and November 22, 2004 have been considered.

Furthermore, Applicants note that the formal drawings filed on August 20, 2004 have not been accepted or objected to by the Examiner. As Applicants can find no comments regarding the drawings in the *Detailed Action* section of the Office Action, Applicants will assume that the formal drawings are acceptable unless indicated otherwise in the next Patent Office communication.

I. CLAIM AMENDMENTS

By the present Amendment, Applicants submit that independent claims 1 and 3 have been amended to recite (*albeit*, in different formats) a biodegradable molded article "being obtainable by heating the molding material and the coating film at a temperature not less than a softening point of the biodegradable plastic but less than a melting point of the biodegradable plastic, wherein (i) the molding through steam expansion and (ii) softening the coating film and attaching the softened coating film to the surface of the biodegradable expanded molded article are performed concurrently." Applicants submit that support for this amendment can be found at least on page 72, lines 5-11 of the Specification, as originally filed. Thus, Applicants submit that the claim amendments do not introduce any new matter.

II. EXAMPLE EMBODIMENTS

Applicants submit that the biodegradable articles taught by example embodiments are arranged such that a coating film, which is thermally softened, is attached to a biodegradable expanded molded article. Example embodiments teach,

> ...as shown in fig. 12 (b), the boundary surface 15 of a layer of the coating film 12 and the surface of the expanded molded article 11 in a cross section of the acquired biodegradable molded article does not become a smooth surface created by the simple attaching (see the condition in the after attaching method in fig. 12 (a)) but becomes, for instance, an irregular surface with bumps and dips, so the coating film 12 is adequately adhered to the expanded molded article 11. Consequently, the attaching condition of the coating film 12 becomes highly strong and as stable as the condition of the attaching by the adhesive layer 13. Thus it is possible to further improve the water resistance and the gas impermeability of the acquired biodegradable molded article.
>
> Specification, pg. 72, l. 18 - pg. 73, l. 5.

Thus, the boundary surface between the coating film and the biodegradable expanded molded article is irregular. The irregularity in the boundary surface encourages sufficient adhesion between the coating film and the biodegradable expanded molded article.

III. CLAIM REJECTIONS ON CITED ART GROUNDS

Claims 1, 3, 6 and 14 stand rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Doane et al. (hereinafter 'Doane'), U.S. Patent No. 5,861,216; claims 7 and 15 stand rejected under 35 U.S.C. §103(a) as obvious over Doane in view of Bradt, U.S. Patent No. 5,888,599; claims 1, 3, 8-12 and 16-20 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as obvious over Ando et al. (hereinafter 'Ando'), U.S. Patent No. 5,639,518; claims 4, 5 and 13 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Ando in view of Shogren et al. (hereinafter 'Shogren'), U.S. Patent No. 6,146,573; claim 2 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable

over Ando in view of Altieri, U.S. Patent No. 5,153,037. Applicants respectfully traverse these rejections in view of the following remarks.

A. INDEPENDENT CLAIM 1

Applicants submit that amended independent claim 1 recites "the biodegradable molded article being obtainable by heating the molding material and the coating film at a temperature not less than a softening point of the biodegradable plastic but less than a melting point of the biodegradable plastic, wherein (i) the molding through steam expansion and (ii) softening the coating film and attaching the softened coating film to the surface of the biodegradable expanded molded article are performed concurrently." Applicants submit that the above-noted features of amended independent claim 1 are not suggested, or taught, by the art cited by the Examiner.

ANDO

Referring to Example 18 and FIG. 8, Ando teaches that a material 23 to be molded is prepared by placing a sheet of material 21 (formed of sweet potato starch, sorbitol and water) and soybean protein sheets 22 (having water and moisture resistant properties) one upon another. Then, the material 23 is "...placed in the mold M1, and dielectrically heated..." Ando, col. 28, ll. 5-8.

Furthermore, Ando teaches that a "...compression laminating method was used as a method for laminating a tray-like molded article with sheets having water and moisture resistant properties." Ando, col. 28, ll. 50-52. Thus, according to the teachings of Ando, applied pressure is used to laminate the sheets 21 and 22.

Applicants submit that Ando fails to teach or suggest that the sheets 21 and 22 are heated to, or laminated at, a predetermined temperature. Therefore, Applicants submit that

there is no motivation to heat the sheets 21 and 22 to "a temperature not less than a softening point" as recited in amended independent claim 1.

As such, the molded articles produced according to the teachings of Ando have a smooth, instead of irregular, boundary between the sheets 21 and 22. Accordingly, Applicants submit that Ando's teachings are conventional.

DOANE

Doane discloses an article having a self-supporting structure made of a mixture of a starch and polyvinyl alcohol in expanded form. Doane teaches that a moisture resistant hydroxyl-functional polyester is provided on the surface of the self-supporting structure. Doane, Abstract.

Applicants submit that the article in Doane is obtained by adhering a polyester film to a starch and blended film, which has been formed into a film shape in advance. For example, Applicants direct the Examiner's attention to Example 6 of Doane which states that "...BIS Adipic was (adhered to) a starch and PVOH blend film..." Doane, col. 13, ll. 10-15. Thus, Doane fails to teach or suggest that the article is prepared by concurrently performing a steam expansion molding operation on the starch and an adhesion operation wherein the coating film is adhered to the surface of the expanded molded article.

Thus, the boundary surface between the film sheet and the expanded article is smooth, instead of irregular. As such, Applicants submit that the teachings of Doane are also conventional.

BRADT, SHOGREN AND ALTIERI

Applicants submit that Bradt, Shogren and Altieri fail to teach or suggest obtaining a biodegradable molded article by heating the molding material and the coating film at a temperature not less than a softening point of the biodegradable plastic. As such, these references fail to cure the deficiencies of Ando and Doane with respect to amended independent claim 1.

ADDITIONAL COMMENTS FOR CONSIDERATION

Further to the above remarks, Applicants submit that the "starch" and "modified starch" taught by Doane and Ando correspond to the "high-amylose corn starch" recited in independent claim 1.

Applicants submit that the "starch" taught by Doane and Ando are formed of general potato, cone, rice, wheat, sweet potato, etc. containing less than 30% amylose as shown in the attached document entitled "International Starch Trading."

Furthermore, the functional groups of the starch taught by Doane are modified, not the molecular structure of the amylose and aminopectin constituting the starch.

Thus, Applicants submit that the "starch" taught by Doane and Ando are not "high-amylose" starches.

B. INDEPENDENT CLAIM 3

Amended independent claim 3 recites "the biodegradable molded article being obtainable by heating the molding material and the coating film at a temperature not less than a softening point of the biodegradable plastic but less than a melting point of the biodegradable plastic, wherein (i) the molding through steam expansion and (ii) softening the coating film and attaching the softened coating film to the surface of the biodegradable

expanded molded article are performed concurrently." Accordingly, Applicants respectfully submit that amended independent claim 3 is patentable for reasons analogous to those noted above with respect to independent claim 1.

IV. DOUBLE PATENTING REJECTION – APPLICATION '130

Claims 1, 6, 7, 11 and 12 stand provisionally rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claims 1, 4, 5, 13-16 and 18 of copending U.S. Application No. 10/505,130. Applicants respectfully traverse this rejection.

Applicants submit that the "starch" recited in the claims of U.S. Application No. 10/505,130 corresponds to the "high-amlyose starch" of independent claim 1. That is, the "starch" of U.S. Application No. 10/505,130 contains less than 30% amylose, as similarly argued above with respect to Doane.

Furthermore, Applicants respectfully note that Applicants are not required to provide arguments regarding the merits of the claims and/or claim amendments until either the present application or U.S. Application No. 10/505,130 issues into a patent.

CONCLUSION

Accordingly, in view of the above, reconsideration of the rejections and allowance of each of claims 1-20 in connection with the present application is earnestly solicited.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) hereby petition(s) for a three (3) month extension of time for filing a reply to the outstanding Office Action and submit the required $1,020 extension fee herewith.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Donald J. Daley at the telephone number below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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By _____
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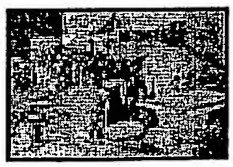
DJD/CDW:psy

Attachment: Document entitled "*International Starch Trading*" (four (4) pages)



International Starch Trading

Science Park Aarhus, Denmark

ǂ starch binder ǂ starch stabilizer ǂ starch texturizer ǂ starch modifier ǂ starch thickener ǂ starch film former ǂ starch adhesive

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Contact

Food
Functional Properties
Applications
Amylose & Amylopectin

Paper
Textile

Industrial Food Starches:

Cornstarch covers 83% of world demand for starch. Most made from dent corn. Special varieties a.o.: *Waxy, High amylose 55%, High amylose 70%.*

Wheat Starch has grown to a 6% share supported by EU.

Potato Starch holding a 6% share depends on EU common agricultural policy.

Tapioca Starch has reached a 4% and increasing share.

Food Starches

Starch is an important constituent in many foods. It plays an obvious role in achieving the desired viscosity in such products as cornstarch pudding, sauces, pie fillings and gravies. It plays a more subtle role in potatoes, cereals, and baked products such as biscuits, muffins, popovers, pastry, cake and bread.

It is used as a water binding and texturizing agent. It has a high viscosity, water-holding capacity and binding abilities.

Potato Starch

Native Potato Starch is a food grade product derived from potato tubers.

It is a white to off-white powder with a moisture below 20%. Gelatinization temperature: 57 - 65 –C. The pH of a slurry in water is neutral. It is an excellent food starch. Potato starch has a lower gelatinization temperature than other starches, a much higher peak viscosity and less resistance to breakdown over prolonged heating. Pastes are extremely clear, with little tendency to retrograde.

Tapioca Starch

Native Tapioca Starch is a food grade product refined from cassava roots. It is used for its bland flavor profile.

It is a white to off-white powder with a moisture below 13%. Gelatinization temperature: 59 - 65 –C. The pH of a slurry in water is neutral. Tapioca Starch is very bland and clean in flavor and is not masking the flavors used. Tapioca starch has a good mouth feel, and is often used in the food industry for thickening.

Cooked it forms a quite clear gel with a long and slightly stringy texture. Upon cooling, it sets to a soft gel. It loses most of its thickening ability during prolonged heating and under acidic conditions. The cooked gel resembles that of potato starch, but the texture is less stringy and the flavor i more neutral, making it a preferred thickener in delicate foods and desserts.

Special food applications: Extruded snacks, where it improves expansion, custard-type pie filling, where it reduces surface cracking and in baby foods as a bodying agent. In biscuits and in cream sandwiches 5–10 % tapioca starch softens the texture and renders the biscuit nonsticky.

In general it may be used as a thickener in foods not subject to rigorous processing.

For household cooking tapioca starch is the starch of choice in thickening fruit desserts – it gives a clear dessert but with improved and "shorter" texture compared to potato starch.

Rice Starch and others are niche products.

Other starches. These "others" starches are attracting interest because they offer versatility to the food designer, and – as native starches – does not load the food label.

AMYLOSE AND AMYLOPECTIN

Normal native starches consist of a mixture of 15–30 per cent. amylose and 70–85 per cent. amylopectin. Amylose structurally is a linear polymer of anhydroglucose units, of molecular weight approximately between 40 000 and 340 000, the chains containing 250 to 2000 anhydroglucose units. Amylopectin is considered to be composed of anhydroglucose chains with many branch points; the molecular weight may reach as high as 80 000 000 (Re. WHO). Amylose is an unbranched chain which is coiled in the shape of a helix. If iodine is added to a solution containing amylose molecules, the iodine inserts itself into the helix making it rigid. This changes the color of the starch mixture to blue or purple depending on the length of the amylose molecule. Amylopectin is a branching molecule which does not form a helical coil. Thus the iodine is not able to bind to the starch molecule. Amylose contributes to the gelling property of starch whereas amylopectin contributes high viscosity. This classic statement, however, may not be entirely valid. Both properties are used in the preparation of foods.

Starch Source	% Amylose	Granule Size microns
Waxy Rice	0	3–8
High Amylose Corn	70	
Corn	28	5–25
Cassava	17	5–35
Waxy Sorghum	0	
Wheat	26	
Sweet Potato	18	
Arrowroot	21	
Sago	26	
Potato	20	15–100

Food Applications

Canning

- filling viscosity aid
- suspension aid for particulates
- opacity agent
- body or texture agent for soups, sauces, puddings and gravies
- aseptically canned products
- beverages such as coffee, teas or chocolate

Cereals and Snacks

- hot extruded snacks

Frozen Foods

- fruit fillings
- meat pies
- Oriental foods
- soups, sauces
- entrees
- cream–based products

Flavors and Beverage Clouds

- encapsulation of flavors, fats, oils vitamins, spices, clouding agents
- spray dried flavors for dry beverage

- chips, pretzels, etc.
- extruded and fried foods
- ready-to-eat cereals

Bakery

- pies, tarts
- fillings, glazes
- custards and icings
- cakes, donuts, Danish
- icing sugar

Batters and Breadings

- coated fried foods
- frozen battered vegetables, fish and meat
- dry mix coatings

Dressings, Soups and Sauces

- mayonnaise-type
- pourable salad dressings (high shear)
- spoonable dressings
- instant dry salad dressing mixes
- low-fat dressing
- canned gravies and sauces
- frozen gravies and sauces
- soups and chowders
- ketchup

Cooked Meat Binder

- water binder for formed meat
- smoked meats, low-fat meats
- pet foods (dried and canned)

mixes, bartender mixes,
- beverage emulsions
- liquid and powdered non-dairy creamers

Confectionery

- dusting powder
- licorice
- jelly gums
- hard gums
- panned candies
- confectioners sugar

Dairy Products

- yoghurt
- cheese and imitation cheese
- chilled desserts
- UHT Puddings
- low-fat products

Microwavable Products

- cheese sauces
- entrees

Synergies with Carrageenan

- carrageenan/starch systems

Functional Properties of Starches in Foods

- specific viscosity (hot and cold)
- thin boiling (faster canning heat transfer)
- viscosity resistance acid/mechanical sheer
- freeze-thaw stability (natural / modified)
- gel texture, body at various temperatures
- clarity, opacity
- processing conditions tolerance
- oil retention, high or low
- resistance to . setback. (gel formation)
- mouthfeel, lubricity, palate-coating
- suspension characteristics
- adhesiveness
- crystallinity
- bland taste
- long shelf-life stability
- hygroscopicity
- color
- anti-caking
- cold-water swelling or dispersibility
- swelling and resistance to

- high sheen
- flow properties
- emulsion stabilizing capacity
- swelling
- film-forming properties

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tapioca,starch,application,food,binder,bodying

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Keywords: glucose,fructose,syrup,starch,native,modified,application,food,viscostar